

Push Button Control for a Hidden Reverse Loop and Staging Area

With off the shelf components!

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November 14, 2015**

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Topics

- **Overview**
- **Components**
- **Wiring**
- **Examples**
- **Tips and Suggestions**

***Caveat: There may be other ways of doing this.
This is just the way I did it***



The Objective

Build a simple and reliable control mechanism for a three-track hidden reverse loop and staging area that,  *with the push of a button:*

- ✓ **Aligns turnouts for the selected route.**
- ✓ **Automatically reverses track polarity in and out of return loop.**
- ✓ **Controls LEDs for route indication and track occupancy.**
- ✓ **Automatically stops trains in staging and turns track power off.**
- ✓ **Restores track power, aligns turnouts and controls LEDs to exit staging.**
- ✓ **Allows through running when desired.**



The Solution

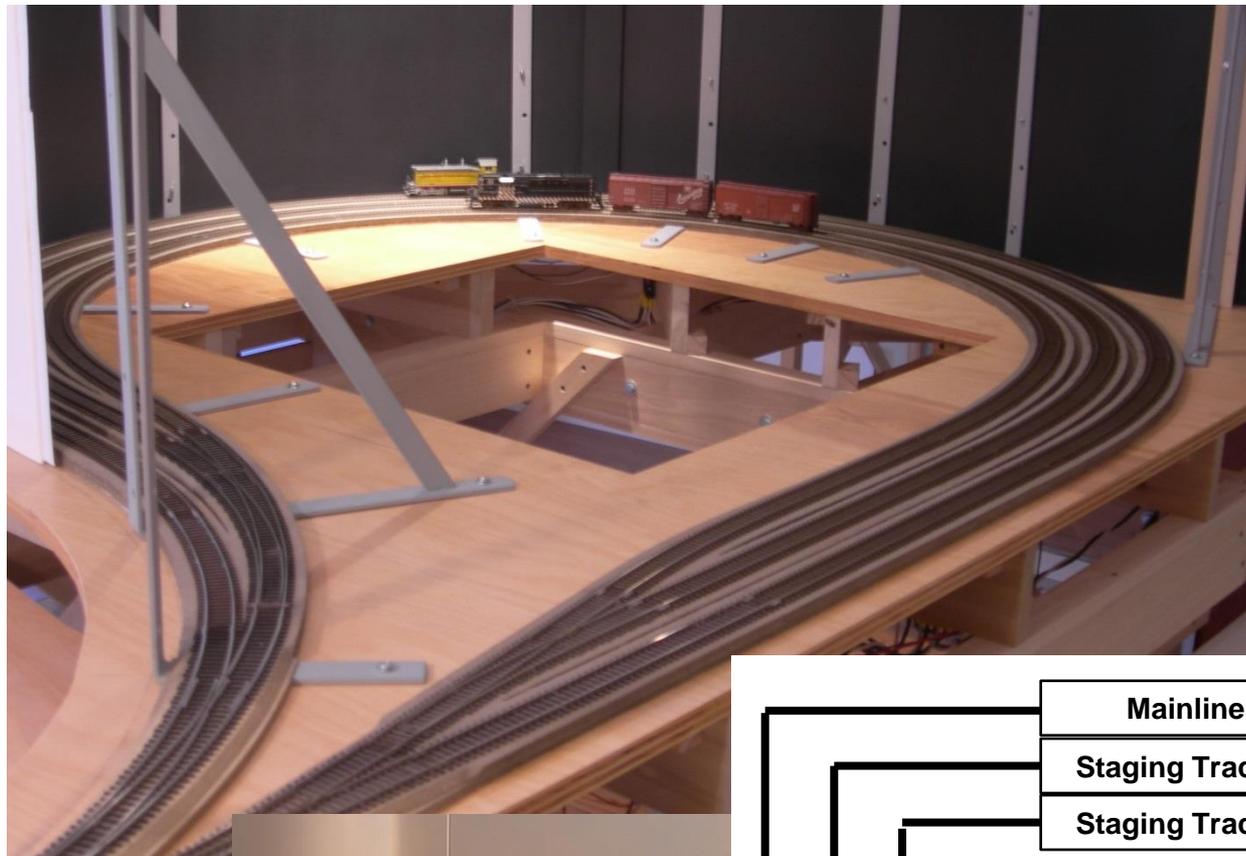
- ✓ An NCE *Mini Panel*
- ✓ 3 DCC Specialties *PSXAR* auto-reversers
- ✓ NCE *Switch 8* and *Switch It* stationary decoders
- ✓ A DCC Specialties *Wabbit* stationary decoder

Plus

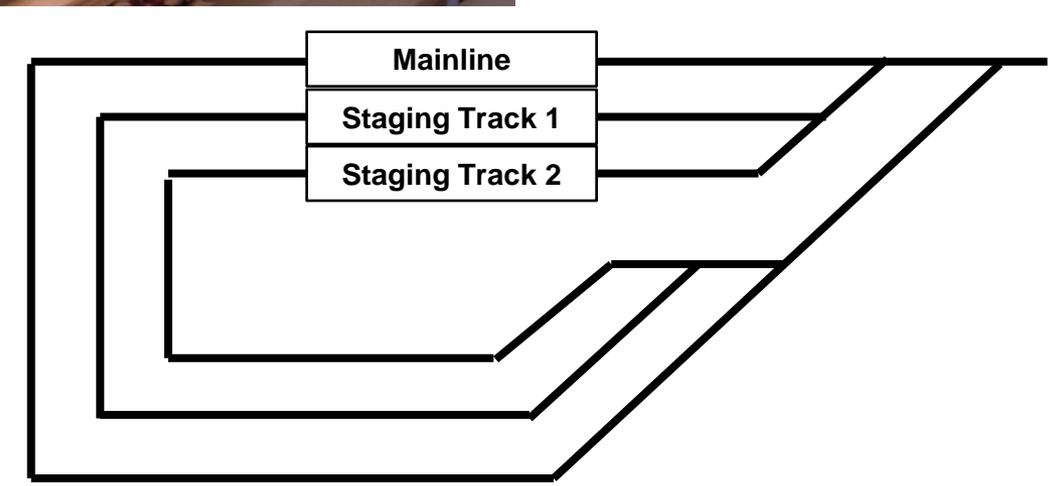
- 5 Tortoise switch machines
- 3 photocells
- 7 push buttons
- 12 LEDs
- Color-coded wire
- Some patience, logic and careful work
(not hard or complicated work, just careful work)



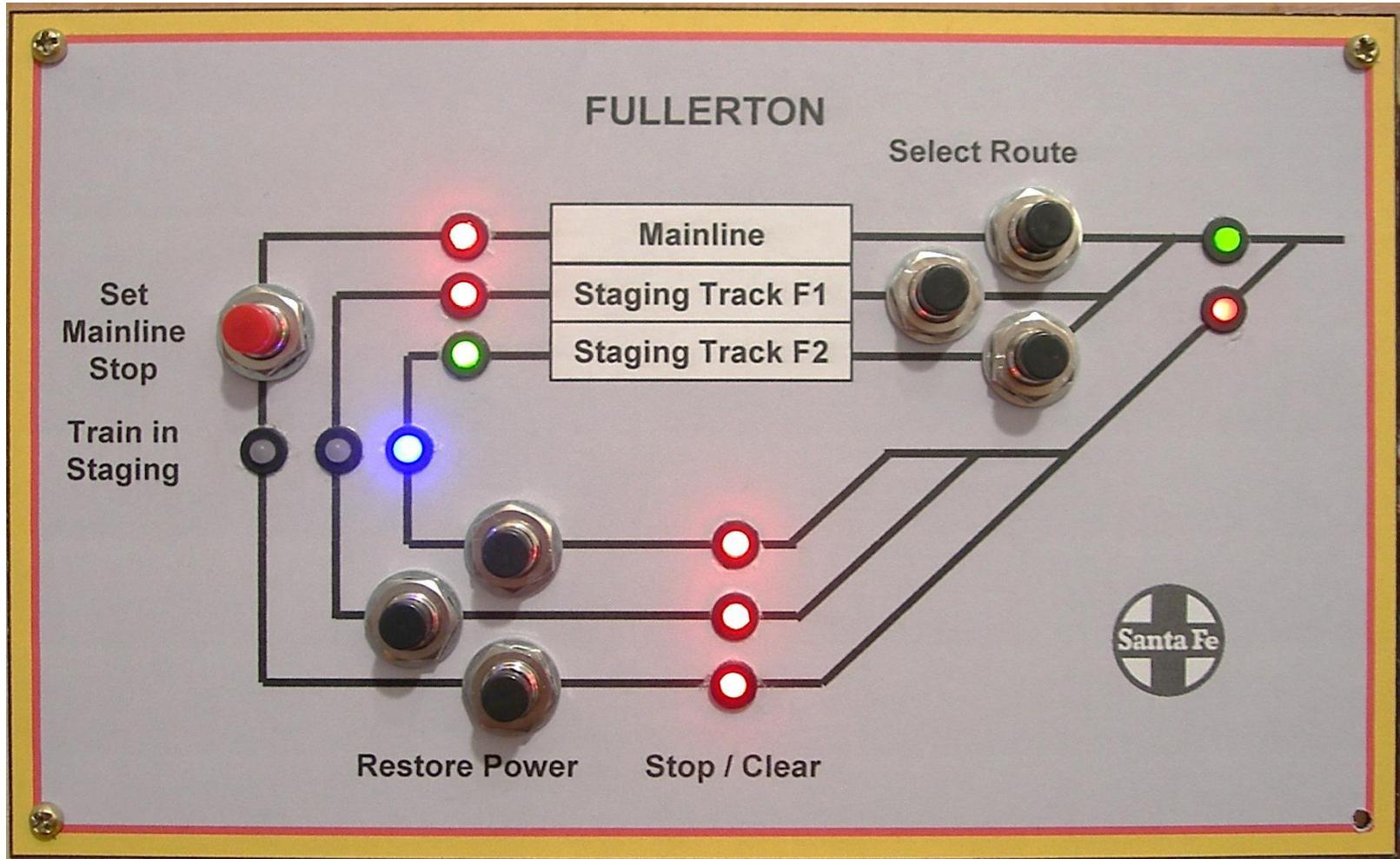
The Setting: "Fullerton" Hidden Return Loop and Staging Area on my Salt Lake Route Layout



Operator's view



The Control Panel



The Components: NCE Mini Panel



- Attaches to cab bus.
- Can activate individual or multiple accessories and/or macros.
- Handles 30 separate inputs; each can issue 4 commands.
- Can also “link” inputs for additional commands.

Think of it this way ... the Mini Panel is just a specialized cab that can send lots of commands at one time.

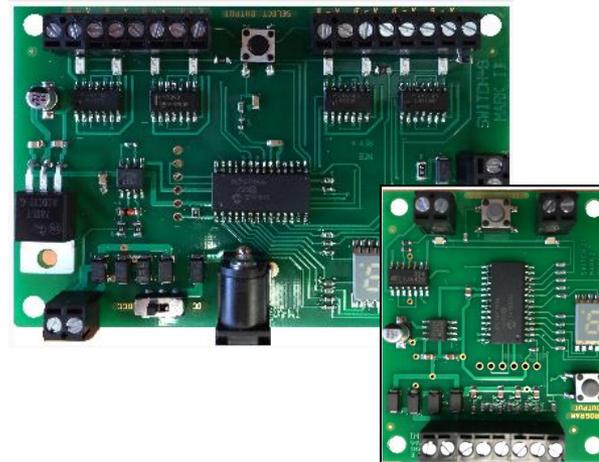
Mini Panel =



The Components: Stationary Decoders

NCE Switch 8 and Switch It

- Attach to track power bus
- Switch 8 controls up to 8 accessories; Switch It controls 1 or 2 accessories.



DCC Specialties Wabbit

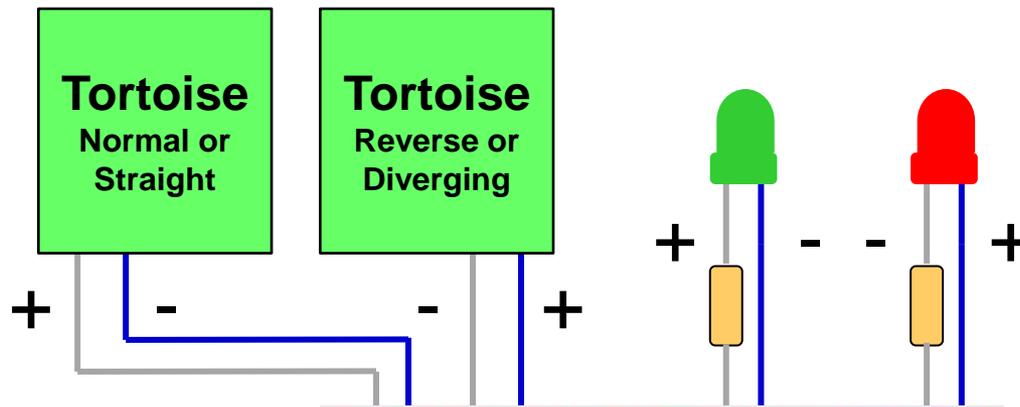
- Attaches to track power bus.
- Controls 1 or 2 accessories.
- Has special features, including:
 - Auto-Return which returns turnout to “normal” position. 0-255 seconds after throw
 - Auto-Align which aligns turnout to approaching train.



Stationary decoders can control switch motors and LEDs

A Tortoise aligns a turnout to “N” or “R” depending on polarity.

LEDs can be controlled the same way. Bi-color LEDs will change color depending on polarity, “N” or “R”.

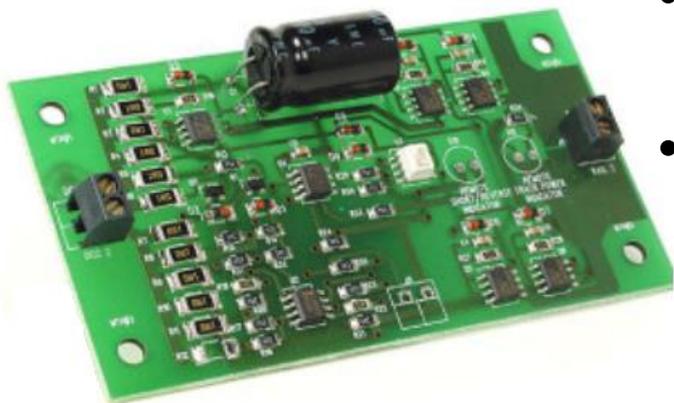


Switch 8

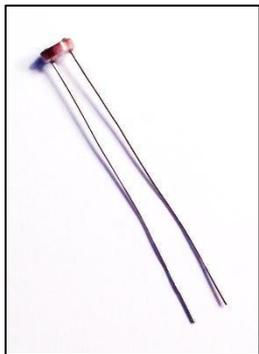


The Components: Auto-Reversers & Photocells

DCC Specialties PSXAR



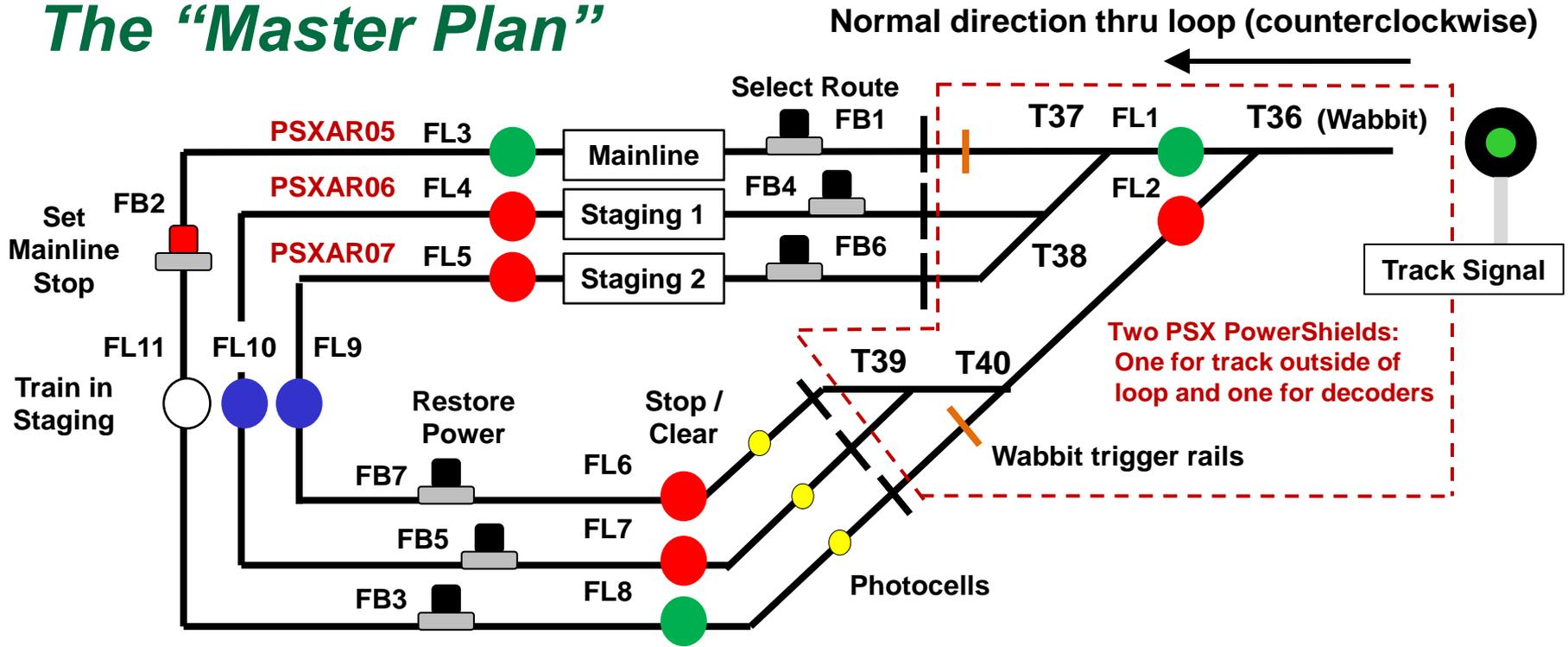
- **Attaches to track power bus.**
- **One reverser required for each track (e.g. 3 tracks = 3 reversers).**
- **Has three accessory addresses:**
 1. **Turn track power on/off.**
 2. **Arm photocell for occupancy detection and power off.**
 3. **Align turnout to approaching train.**



Silonex NSL-6112 Photocell

- **Mounts between ties, one per track.**
- **Connects to PSXAR.**
- **Powered by separate 12VDC supply.**

The "Master Plan"

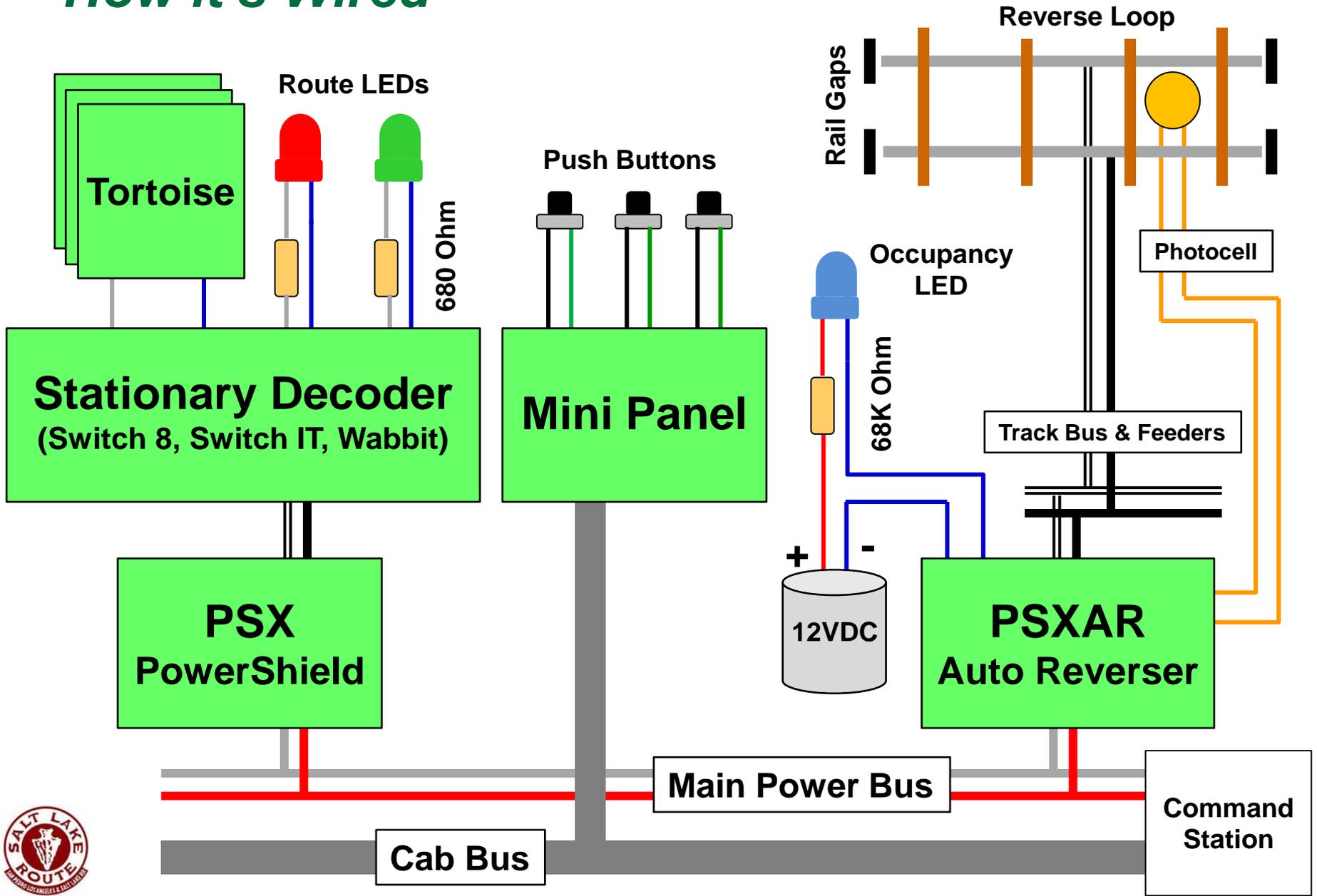


Button	Turnouts					Route LEDs					Stop/Clear LEDs			Photo Cells			Occupancy LEDs			
	T36	T37	T38	T39	T40	FL1&TS	FL2	FL3	FL4	FL5	FL6	FL7	FL8	PSXAR05	PSXAR06	PSXAR07	FL9	FL10	FL11	
FB1	N	N			R	G	R	G	R	R	R	R	G							
FB2													R	arm trk pwr off						B
FB3	R				R	R	G	R	R	R	R	R	G	track power on						
FB4	N	R	R			G		R	G	R	R	R	R		arm trk pwr off				B	
FB5	R			R	N	R	G	R	G	R	R	G	R		track power on					
FB6	N	R	N			G		R	R	G	R	R	R			arm trk pwr off	B			
FB7	R			N	N	R	G	R	R	G	G	R	R			track power on				



This will not be on the quiz

How it's Wired



Mini Panel Programming Example

Button 6 – “Select Staging Track 2”

Input	Step	Accy	Comd	Action
6	1	36	N	T36 Normal
	2	37	R	T37 Reverse
	3	38	N	T38 Normal
	4	link	16	Link to Input 16
16	1	M35	-	Call Macro 35
	2	743	N	Arm S2 photocell

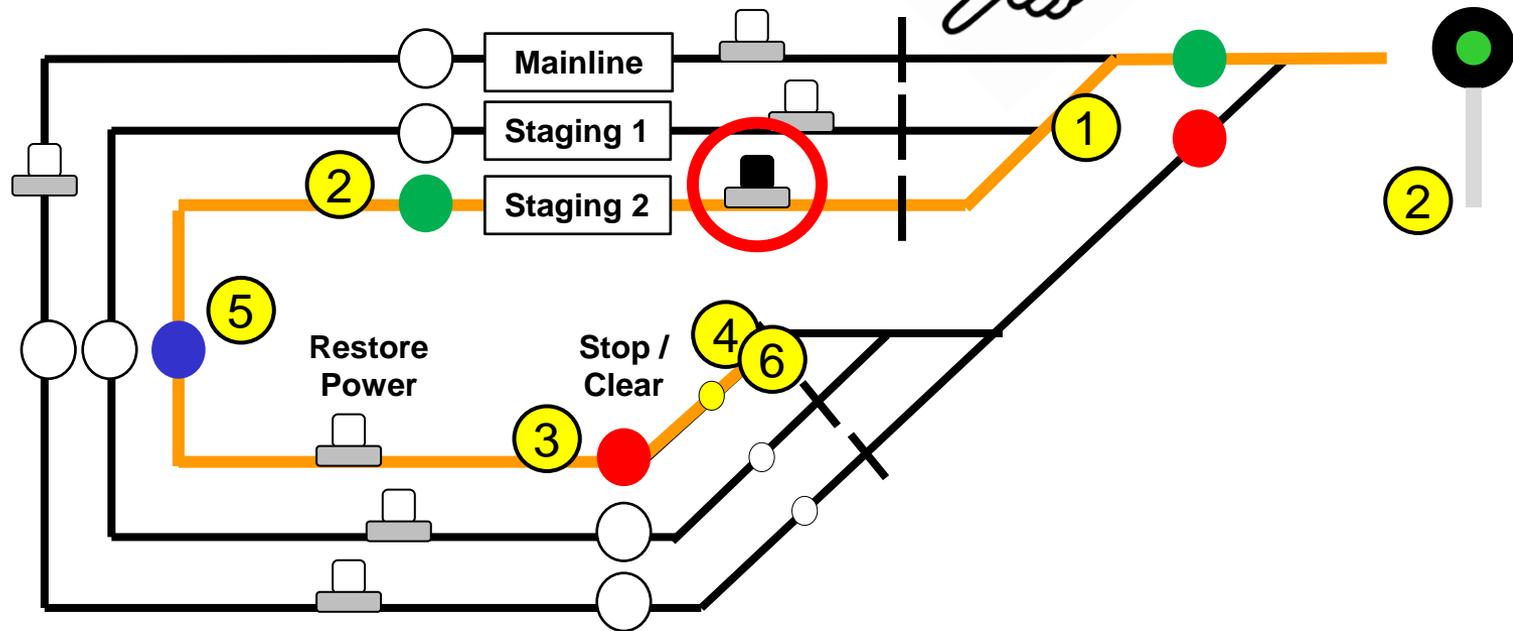
Macro 35

Accy	Comd	Action
203	R	FL3 Red
204	R	FL4 Red
205	N	FL5 Green
206	R	FL6 Red
207	R	FL7 Red
208	R	FL8 Red



Example: *Select Staging Track 2*

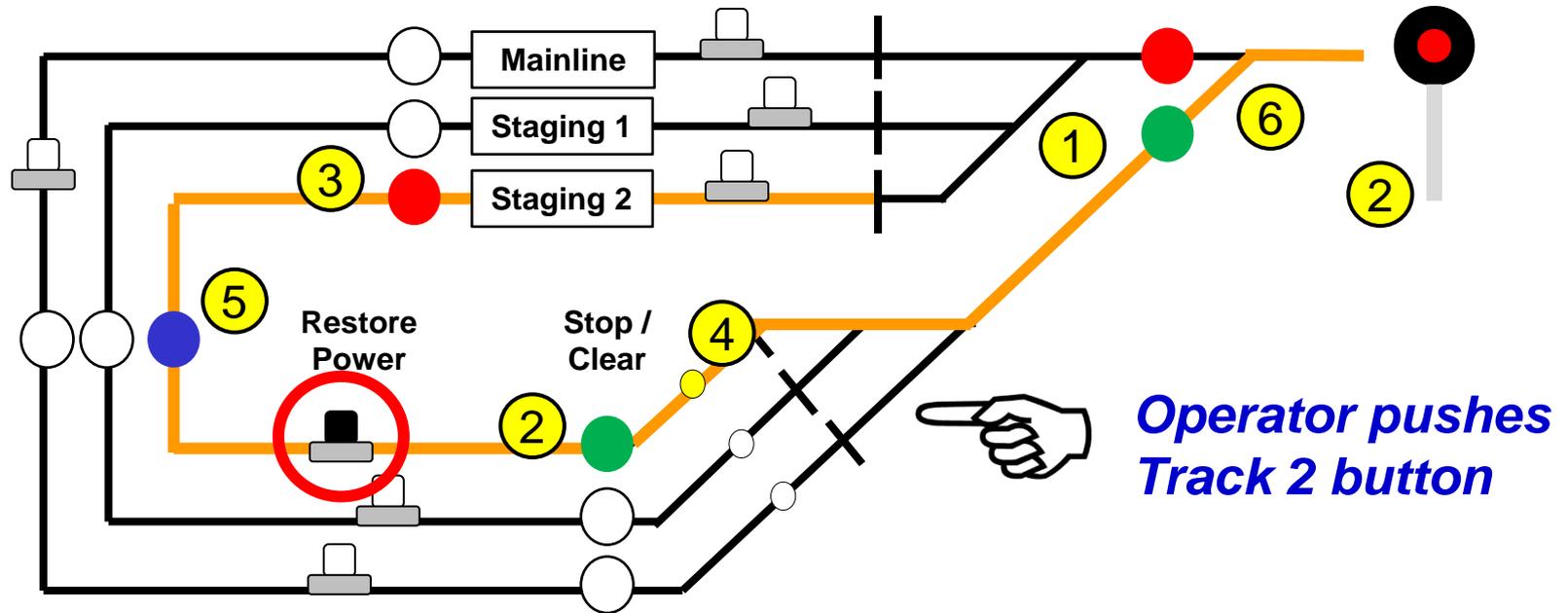
Operator pushes Track 2 button



What happens?

1. Throat turnout aligned to “Normal”; Loop turnouts aligned for Track 2.
2. Route and searchlight signal LEDs change from Red to Green.
3. “Stop / Clear” LED changes to Red.
4. PSXAR is “armed” to stop train at photocell.
5. Blue Occupancy LED begins flashing.
6. Train stops at photocell, and ...
 - Track power turns off; Occupancy LED changes to fully on.

Example: Release Train on Track 2



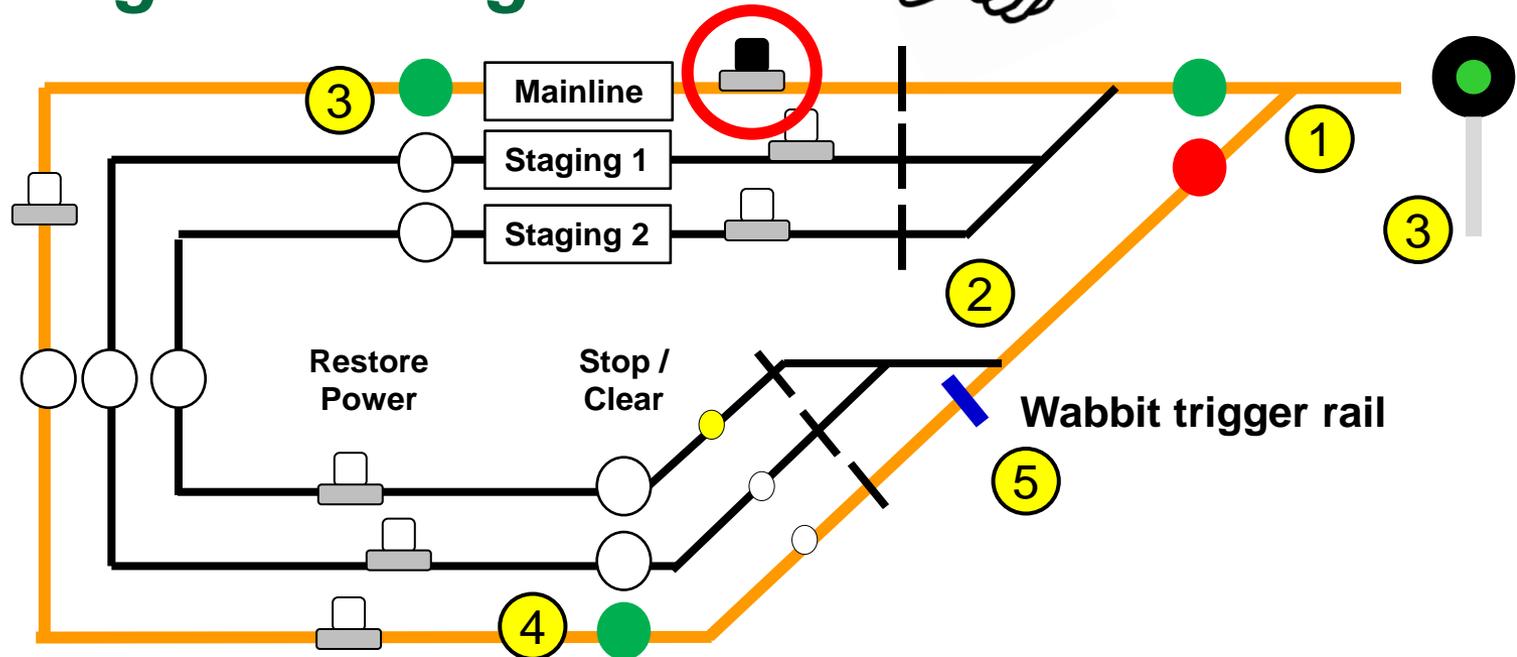
What happens?

1. Throat turnout aligned to "Reverse"; Loop turnouts aligned for Track 2.
2. "Stop / Clear" LED changes to Green.
3. Route and searchlight signal LEDs change from Green to Red.
4. Track 2 power restored – Train can proceed.
5. Blue Occupancy LED remains on until train passes over photocell.
6. Wabbit "Auto-restores" throat turnout and LEDs to "Normal" after 1 ½ minutes.



Example: Set Mainline for Through Running

Operator pushes Mainline button



What happens?

1. Throat turnout aligned to “Normal”.
2. Loop turnouts aligned for Mainline.
3. Route and signal LEDs change from Red to Green.
4. “Stop / Clear” LED changes to Green.
5. Wabbit “Auto-aligns” throat turnout to “Reverse” as train crosses trigger rail and turnout position LEDs reverse; Wabbit “Auto-restores” turnout, LEDs and signal to “Normal” after 1 ½ minutes.



Other stuff I used

LEDs

- **Red / Green 3mm bi-color LEDs**
 - **Chicago Miniature, part #4301F1/5 (Mouser)**
- **Blue 3mm occupancy LEDs**
(Brand and specs unknown – “eBay”)

Push Buttons

- **APEM SPST NO, part #MPB1110 (Mouser)**

Photocells

- **Silonex NSL-6112 (Allied Electronics)**

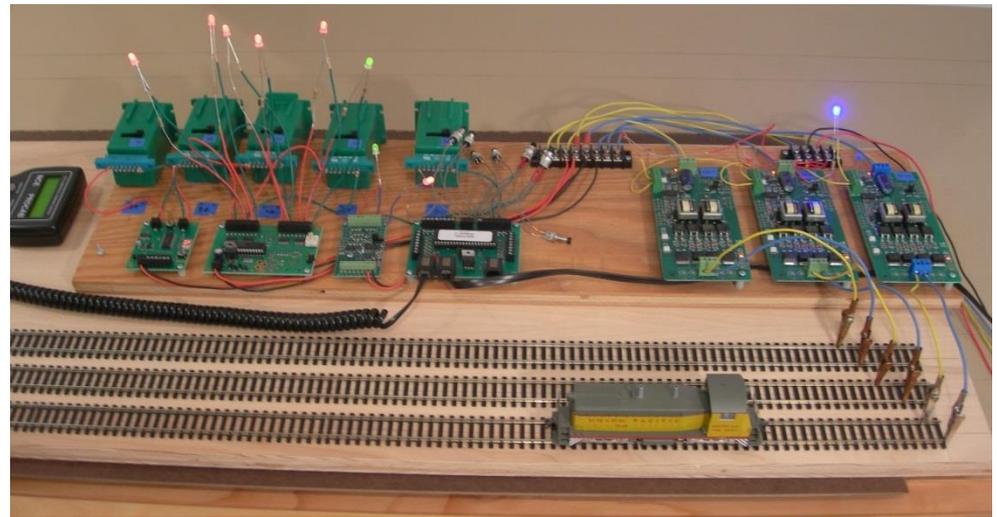
Wire

- **18 AWG stranded track feeder wires off of 12 AWG stranded bus wires**
- **24 AWG stranded on all component hook-up wires**
- **32 AWG magnet wire from photocell inside 5/32” brass tube through sub-roadbed (~8”) (Amazon)**



Tips and suggestions if you want to try this

- Read the manuals – Everything is pretty easy to understand. Everything I did is “standard”.
- Set up, test, program and record everything at the workbench.
- Test each step as you install it.



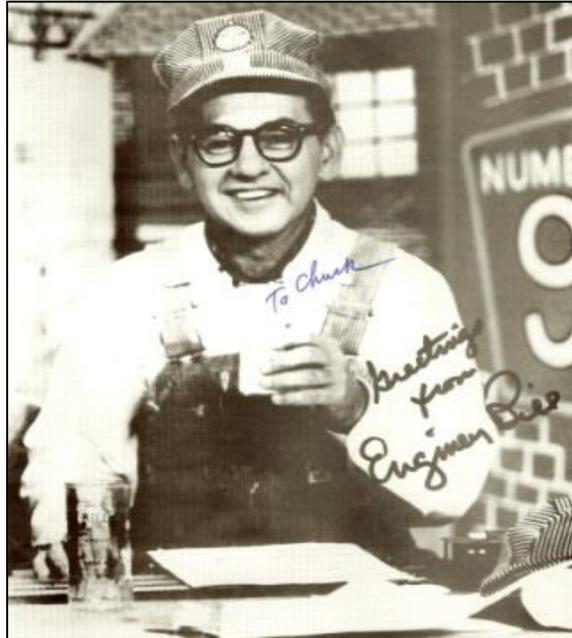
- Label all components, terminal strips and wires.
- Color-code and bundle wires.
- Take your time.

Feel free to contact me if you get stuck or confused!



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Questions?



“On the green light you go and on the red light you stop, because no engineer would ever run a red light.”

“Engineer Bill” Stulla, KHJ-TV Cartoon Express, Los Angeles, 1954

